REMARKS

Upon entry of this amendment, claims 1-9, 11-21, 23-25, 30-35, 37-38, 113 and 118-120 are pending. Claims 10, 22, 26-29, 36, 39-112 and 114-117 have been canceled and claims 118-145 have been added.

In the interests of advancing prosecution, claim 1 has been amended to focus upon one presently preferred embodiment of the invention, *i.e.*, an assay platform for isolating, harvesting, detecting or quantifying a target polypeptide molecule wherein the binding ligand is selected from a specified group of polypeptide binding ligands. Support for the amendment to claim 1 may be found, for example, at page 1 (paragraph 0001), at pages 6-8 (paragraphs 0019 - 0023), Examples 1 and 8 (nickel chelate), Example 2 (hydrophobic binding ligand), Examples 3-4 (anion exchanger), Example 5 (cation exchanger), Example 7 (streptavidin), and original claims 24, 37, and 38 of the specification. Applicants reserve the right to pursue other embodiments of claim 1 as originally presented in a continuation application.

Election/Restriction

The non-elected claims, *i.e.*, claims 39-112 have been canceled. Applicants reserve the right to pursue the subject matter thereof in one or more divisional applications.

35 U.S.C. 112 Rejection

Reconsideration is requested of the rejection of claim 117 under 35 U.S.C. 112, second paragraph. This claim has been canceled, thereby rendering this rejection moot.

35 U.S.C. 102/103 Rejections

Reconsideration is requested of the rejection of claims 1-9, 11-38, and 113 under 35 U.S. C. 102(b) as anticipated by, or in the alternative, under 35 U.S.C. 103(a) as obvious over Sundberg et al. (U.S. Patent No. 5,624,711).

Claim 1 is directed to an assay platform for isolating, harvesting, detecting or quantifying a target ***polypeptide*** molecule. The platform comprises a substrate, a polymer matrix attached to the substrate, and a binding ligand attached to the polymer matrix. The binding ligand has an affinity for the target polypeptide. In addition, the polymer matrix is covalently attached directly to the substrate at a density of at least 2 $\mu g/cm^2$.

In contrast, Sundberg et al. describe methods and derivatized supports which are useful in solid-phase synthesis of peptides, oligonucleotides or other small organic molecules as well as arrays of ligands.[1]

> The advent of methods for the synthesis of diverse chemical compounds on solid supports has resulted in the genesis of a multitude of diagnostic applications for such chemical libraries. A number of these diagnostic applications involve contacting a sample with a solid support, or chip, having multiple attached biological polymers such as peptides and oligonucleotides, or other small ligand molecules synthesized from building blocks in a stepwise fashion, in order to identify any species which specifically binds to one or more of the attached polymers or small ligand molecules.[2]

These solid phase synthesis applications for the stepwise preparation of the peptides, oligonucleotides or other small organic molecules include light-directed methods, flow channel and spotting methods, pin-based methods and bead-based methods."[3] For use in these synthetic methods, Sundberg et al. identify polymer coated surfaces prepared by any of a variety of methods: dip-coating, covalent attachment and *in situ* synthesis.[4] In addition, the polymeric coating may be dextran (500 Kd) or another glycan.

Several differences between the invention defined by claim 1 and Sundberg et al.'s solid support for oligomer synthesis may thus be noted. Among other things, claim

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[1]Sundberg et al., U.S. Patent No. 5,624,711 (abstract).

[2]Sundberg et al., U.S. Patent No. 5,624,711 at column 9, lines 43-53.

[3]Sundberg et al., U.S. Patent No. 5, 624,711 at column 6, lines 37-41.

[4]Sundberg et al., U.S. Patent No. 5,624,711 at columns 15-16.

1 is directed to an assay platform for isolating, harvesting, detecting or quantifying a target ***polypeptide*** molecule. The platform comprises a substrate, a polymer matrix attached to the substrate, and a binding ligand for the target polypeptide wherein the binding ligand is selected from a defined group of binding ligands. In contrast, Sundberg et al. disclose the preparation of methods and derivatized supports which are useful in ***stepwise*** solid-phase synthesis of peptides, oligonucleotides or other small organic molecules.

Claim 1 requires that the polymer matrix be covalently attached directly to the substrate at a density of at least 2 $\mu g/cm^2$. Sundberg et al. do not disclose the surface density of their polymeric coating. Nor is a coating at this density inherent. See, for example, the Declaration of Dr. William Kappel, submitted on February 6, 2003.

Sundberg et al. similarly fail to suggest any surface coating density for the polymer on the substrate; before the Office may properly assert that the selection of coating density would be within the level of skill in the art, the Office must show that this property was known to be a result-effective variable. In this instance, it was critical to Sundberg et al. that their surface be suitable for use as a support for solid phase synthesis. They attach no significance to the polymer coating thickness; presumably, if thickness were critical to their application, they would have specified it. They did not, and thus, it is not proper for the Office to assert that controlling the thickness would have been obvious to a person of ordinary skill when, Sundberg et al., failed to even address this variable.

Sundberg et al. also fail to disclose or suggest attachment of any of the binding ligands specified by claim 1. Instead, Sundberg et al. disclose the use of polymer coated substrates for use in a ***stepwise*** growth process for the preparation of peptides, oligonucleotides, and small organic molecules (capable of such stepwise growth). As such, their disclosure is, at best, non-informative and, at worst, non-enabling; there is nothing in Sundberg et al. which suggests how any of the binding ligands specified by claim 1 could be grown on the substrate in a stepwise manner. In any event, they fail to disclose or suggest the platform of claim 1 which has, as a component, a polypeptide binding ligand.

Claims 4 - 7 depend from claim 1 and require that the polymer matrix have a binding ligand density of at least 1 nanomole/cm^2 (claim 4), 1.2 to 185 nanomoles/cm^2 (claim 5), 1.5 to 90 nanomoles/cm^2 (claim 6) or 1.8 to 15 nanomoles/cm^2 (claim 7). Notably, the Office did not even attempt to articulate a *prima facie* case of obviousness with respect to the features specified by these claims.

Claims 16 -21 depend from claim 1 and require that the assay platform have the capacity to bind polypeptides having a molecular weight of less than 3.5 kDa in an amount of at least 1 nanomole/cm^2 (claim 16), 3.5 to 500 kDa molecular weight polypeptides in an amount of 0.5 to 20 µg/cm^2 (claim 17), 10 to 500 kDa molecular weight polypeptides in an amount of 1 to 20 µg/cm^2 (claim 18), 10 to 350 kDa molecular weight polypeptides in an amount of 2 to 20 µg/cm^2 (claim 19), 10 to 350 kDa molecular weight polypeptides in an amount of 3 to 15 µg/cm^2 (claim 20), 10 to 350 kDa molecular weight polypeptides in an amount of 4 µg/cm^2 to 10 µg/cm^2 (claim 21), or up to 350 kDa molecular weight polypeptides in an amount of at least 2 µg/cm^2 (claim 23). Again, the Office did not even attempt to articulate a *prima facie* case of obviousness with respect to the features specified by these claims.

Claims 24 and 25 depend from claim 1 and require that the ligand comprise a metal chelate. Not only did the Office fail to articulate a *prima facie* case of obviousness with respect to these claims in view of Sundberg et al., it cannot. Sundberg et al. disclose the use of polymer coated substrates for use in a ***stepwise*** growth process for the preparation of peptides, oligonucleotides, and small organic molecules (capable of such stepwise growth); metal chelates do not qualify as any of these.

Claims 30 to 32 depend from claim 1 and require that the binding ligand comprise a spacer (claim 30), and that the spacer comprise a lysine derivative (claim 31), or an aminocaproic acid derivative (claim 32). The Office did not attempt to articulate a *prima facie* case of obviousness with respect to the features specified by these claims.

Claims 33 - 35 and 37 - 38 depend from claim 1 and require that the substrate be a multiwell polystyrene or polypropylene plate, that the polymer matrix comprise a

dextran polymer or derivative thereof, that the binding ligand be a nickel chelate (claim 33), a gallium or iron chelate (claim 34), glutathione (claim 35), streptavidin (claim 37) or protein A, protein G, protein L, or a mixture thereof (claim 38), and that the binding ligand be present at a density of 1.5 nanomoles/cm^2 to 7.5 nanomoles/cm^2.

Other dependant claims introduce further or other requirements which distinguish the subject matter of the pending claims from substrate disclosed by Sundberg et al.

Claim 113, an independent claim, requires, among other things, that the polymer matrix be a crosslinked mixture of at least two polymers formed by (i) combining the substrate with a mixture comprising first and second polymers, the first polymer possessing a reactive group which upon activation crosslinks the first and second polymers to form the polymer matrix and covalently attaches the polymer matrix to the substrate, the second polymer having an absence of such reactive groups, and (ii) activating the reactive groups of the first polymer in the combination to form the polymer matrix and covalently bind the matrix to the substrate. In addition, the density of the crosslinked polymer matrix on the substrate is at least 2 μg/cm^2. Sundberg et al. neither disclose nor suggest such an assay platform meeting these requirements.

In summary, Sundberg et al. fail to disclose or suggest the subject matter of the pending claims. Accordingly, the rejection of such claims under 35 U.S.C. 102(b) and/or 103(a) may properly be withdrawn.

Reconsideration is requested of the rejection of claims 1, 11 and 115 under 35 U.S.C. 102(e) as being anticipated by Srinivasan et al. (U.S. Patent 6,074,541). Among other things, claim 1 requires a polypeptide binding ligand and that the polymer matrix be covalently attached directly to the substrate at a density of at least 2 μg/cm^2 and a binding ligand selected from the group consisting of metal chelates, anion exchangers, cation exchangers, hydrophobic binding ligands, antibodies, streptavidin, avidin, biotin, glutathione, protein A, protein G, and protein L.

In contrast, Srinivasan et al. disclose preformed polymer coatings useful in capillaries or chromatography packing. Their primary concern was the formation of a cross-linked coating of preformed polymer directly or indirectly covalently linked to the surface of the support. Significantly, Srinivasan et al. do not disclose the surface

density of their polymeric coating nor, for the reasons previously pointed out, coating at the density required by claim 1 is not inherent. See, for example, the Declaration of Dr. William Kappel, submitted on February 6, 2003. Furthermore, and in any event, Srinivasan et al. do not disclose or suggest attaching a binding ligand selected from the group specified by claim 1 to the polymer. Thus, Srinivasan et al. do not anticipate claim 1.

Claim 11 depends from claim and thus is distinguishable for the same reasons as those stated with respect to claim 1. Claim 115 has been canceled and thus, the rejection is now moot as to this claim.

Reconsideration is requested of the rejection of claims 1 and 10 under 35 U.S.C. 102(e) as being anticipated by Siuzdak et al. (U.S. Patent 6,288,390 B1). Among other things, claim 1 requires a polypeptide binding ligand and that the polymer matrix be covalently attached directly to the substrate at a density of at least 2 $\mu g/cm^2$.

Siuzdak et al. do not disclose substrates possessing a binding ligand of claim 1. Instead, they merely adsorb analyte to their substrate. See, for example, Siuzdak et al. at column 8, lines 15-25 and at column 16, lines 30-38. Nor do they disclose the coating density of a polymeric coating on the surface of their substrate and, as previously pointed out, coating at the density specified by claim 1 is not inherent. See, for example, the Declaration of Dr. William Kappel, submitted on February 6, 2003.

Reconsideration is requested of the rejection of claim 117 under 35 U.S.C. 102(b) as being anticipated by Sundberg et al. Claim 117 has been canceled, thus rendering this rejection moot.

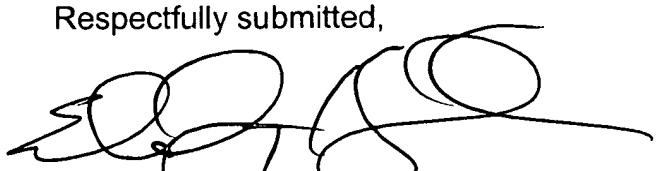
Also being filed herewith is a new Power of Attorney by Assignee, Revocation of Prior Powers and Change of Correspondence Address.

CONCLUSION

In light of the foregoing, applicants request entry of the claim amendments, a withdrawal of claim rejections, and allowance of the claims. The Office is invited to contact the undersigned attorney should any issue remain unsolved.

A check in the amount of $950.00 for a three month extension of time is enclosed. The Commissioner is hereby authorized to charge any fees which may be required for this response to Deposit Account No. 19-1345.

Respectfully submitted,



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